

February 23, 1951

Dr. E. C. Kleiderer
Eli Lilly and Company
Indianapolis 6, Indiana

Dear Erv:

I am writing to let you know about progress in the plasma substitute field, and especially to find out if there is any chance that Eli Lilly would be interested in the manufacture of Oxypolygelatin.

I understand that contracts are being let for a large number of units - of the order of millions - of periston and dextran. I myself feel very strongly that Oxypolygelatin is a plasma substitute superior to either of these two, and also superior to gelatin solution for transfusion. I feel that the fate of periston and dextran in the human body is uncertain, and that these substances may produce serious injuries to organs, sometime after their injection. On the other hand, I believe that we can be sure that gelatin and Oxypolygelatin are rapidly hydrolyzed, and that they would not produce serious long-time damage. There are several advantages of Oxypolygelatin over gelatin. One of them is that a solution with satisfactory osmotic properties is liquid, whereas a solution of gelatin with satisfactory osmotic properties is a gel at room temperature, and must be warmed to body temperature for injection. Another real advantage of Oxypolygelatin is that the final step, autoclaving with hydrogen peroxide, leads to destruction of pyrogens, so that Oxypolygelatin preparations are uniformly non-pyrogenic, whereas I understand that there is a large percentage of discard of gelatin preparations because of pyrogenicity.

One aspect of Oxypolygelatin that needs further study is the nature of the chemical action of glyoxal and hydrogen peroxide on gelatin. There is the possibility that the hydrolyzed Oxypolygelatin contains undesirable materials formed from the amino acid residues in gelatin by the action of glyoxal and hydrogen peroxide. We do not have any evidence that such materials are present, but we are investigating this question.

We are also investigating the whole problem of alteration of gelatin to produce a more satisfactory plasma substitute, with the idea that perhaps the use of glyoxal can be eliminated. We have been working under a new contract from the Public Health Service for several months, and the Office of Naval Research has also given us a contract, for work on plasma substitutes.

Dr. Kleiderer

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You may be interested to know that I have been serving as the chairman of a committee that is planning a very large scale program in the protein synthesis field - that is, the manufacture of large polypeptides, and their investigation as to usefulness as plasma substitutes or for other medical purposes. We are planning to investigate the physiological properties of moderately small peptides as well as of the very high polymers in connection with this work. The Navy will support our program of research on the structure of proteins, since information about the structure of proteins may be important in an attempt to manufacture protein substitutes for special purposes.

With best regards, I am

Sincerely yours,

Linus Pauling:W